USDA

United States Department of Agriculture

Forest Service

Medicine Bow – Routt National Forests & Thunder Basin National Grassland

Laramie, Wyoming

Noxious and Invasive Plants Effects Report

Medicine Bow Landscape Vegetation Analysis (LaVA) Project

Medicine Bow National Forest

Albany and Carbon Counties, Wyoming

April 2020

/s/ Wendy Haas, /s/ Jackie Roaque **April 2020**

/s/Brad Weatherd, /s/ Geri Proctor **Date**

W. Haas, J. Roaque, B. Weatherd, G. Proctor

Medicine Bow National Forest

2468 Jackson St.

Laramie, WY 82070

307-745-2300 / 307-326-2505

Reviewed for cumulative effects on 07/13/2020 in response to the June 10, 2020 Objection Instructions. No changes were made**.**

Table of Contents

SUMMARY

Non-native invasive plants create a variety of well-documented negative impacts upon natural ecosystems, including native plant and animal diversity and population size, soil stability and chemistry, and watershed function (Westbrooks 1998). This report discusses the effects of a proposed landscape scale vegetation management project upon noxious and invasive plants management on the Snowy Range and Sierra Madre mountain ranges within the Brush Creek/Hayden (BCH) and Laramie Ranger Districts of the Medicine Bow National Forest. It also discusses the effects of the No Action alternative. This proposed project would authorize vegetation management activities for the next 10-15 years and could authorize up to 95,000 acres of stand initiating or even-aged forest treatment methods, up to 165,000 acres of uneven-aged or intermediate forest treatments and up to 100,000 acres of other vegetation treatments such as prescribed fire, mastication and hand-thinning in forested and non-forested areas.

FOREST PLAN DIRECTION

Revised Land and Resource Management Plan for the Medicine Bow National Forest (USDA Forest Service 2003)

When appropriate or where necessary to meet resource management objectives, increase the amount of forests and rangelands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species. (USDA Forest Service Strategic Plan 2000 Revision Objective 1.c)

Within 10 years, minimize or reduce the spread of noxious weeds and nonnative invasive species and implement measures that minimize new introductions.

Implement the Forest noxious weed control and implementation plan addressing awareness, prevention, inventory, planning, treatment, monitoring, reporting, and management objectives.

Cooperate with appropriate public agencies and adjacent landowners.

Trailhead facilities, including signs, are well-maintained at all wilderness portals. Areas of overuse within wilderness areas are identified and appropriate management practices are put into place to attain wilderness goals. Noxious weeds and invasive non-native plants are inventoried, aggressively treated, and contained/reduced.

Noxious weed populations are being identified and mapped with the primary emphasis in preventing new noxious weed infestations while aggressively pursuing control and eradication of existing populations.

Standards 1. For all proposed projects or activities, determine the risk of noxious weed introduction or spread and implement appropriate mitigation measures. [R2 Desk Guide]

ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

Brief Description of the No Action Alternative

The No Action Alternative assumes that the Modified Proposed Action would not be implemented. Other vegetation and fuels management projects (such as timber sales; tree thinning; watershed and wildlife habitat restoration; and fuels reduction) would be expected to proceed under the No Action Alternative, authorized under separate National Environmental Policy Act (NEPA) analyses or authorities. Cumulatively, these projects would not treat as many acres of land within the time frame anticipated for the proposed action but would continue at similar levels to those that have occurred since the Medicine Bow National Forest Revised Land and Resource Management Plan was approved in 2003. It is estimated that an average of about 5,067 acres per year would be treated and about 5 miles of temporary road might be constructed per year. Over a 15 year period (equivalent to the time frame for the proposed action) it is estimated there would be about 76,005 acres treated and about 75 miles of temporary road constructed under the No Action Alternative. That contrasts sharply with a possible maximum of 360,000 acres of treated vegetation and up to 600 miles of temporary road constructed over the life of the Modified Proposed Action. A more detailed description of the No Action Alternative is included in the Final Environmental Impact Statement (FEIS) for this project.

Direct and Indirect Effects of the No Action Alternative

Weed infestations will continue to spread in areas where soils and/or vegetation are disturbed by a variety of activities and events on the Forest, despite our ongoing treatment program. Activities which can introduce and/or spread invasive plants are numerous and are listed in the cumulative effects segment of this report. Weeds have been increasing in coniferous stands over the past decade where tree mortality has been high due to the mountain pine beetle epidemic. In many of those stands more sunshine and water are available for understory plants, and thistles and other invasive plant species have been some of the first to take advantage of these new growing sites.

With the current condition of forest stands affected by the mountain pine beetle, the Forest Service is now limited in the suppression tactics it can employ in the event of a wildfire. It is not safe to stage fire-fighters in areas of heavy downfall and standing dead timber, and it takes longer to prepare effective fire lines in such stands. Because of our limited fire-fighting options, some fires may not be containable until they reach significant contiguous changes in fuels such as grasslands or shrublands at or beyond the Forest Boundary, major highways, or major watercourses. Some fires may therefore grow larger before they can be contained than they would have before the beetle epidemic. Already, wildfires over the past 7 years within the project area have burned an average of 10,300 acres per year, while over the past 15 years the average was 4,900 acres burned per year. Larger wildfires means more acres of land that that have an increased susceptibility to invasion by noxious weeds or other invasive plant species such as cheatgrass because competing vegetation has been removed or damaged and bare soil is exposed.

BCH and Laramie Districts have weed treatment programs that focus on noxious weeds listed by the State of Wyoming, but the program is not large enough (constrained by funding levels and manpower) to inventory and treat all known noxious weed infestations. In many locations, Canada thistle, one of the state listed noxious weeds, is not treated because it is so widespread in a variety of habitats. With a limited weed treatment budget we have prioritized treatment of more harmful noxious weed species

and weed populations small enough that we have a chance at containment or eradication. Funds for inventory or treatment of other invasive plant species not listed as noxious may or may not be available in any given year due to fluctuations in funding and changes in overall program emphases within the Forest Service.

Alternative 2 – Modified Proposed Action

A Brief Description of the Modified Proposed Action

The Forest Service proposes to conduct vegetation management activities on NFS lands, including inventoried roadless areas, within the Sierra Madre and Snowy Range Mountain Ranges of the MBNF. Vegetation management activities, including prescribed fire, mechanical, and hand treatment methods, could be applied on up to 360,000 acres to make areas more resilient to future disturbance; protect, restore, and enhance forest ecosystem components; supply forest products to local industries; provide for human safety; reduce wildfire risk to communities, infrastructure, and municipal water supplies; and improve, protect, and restore wildlife habitat. Specific treatments would be developed and authorized for implementation over a 10-year period beginning in 2019 and would be completed within approximately 15 years of the project decision. A combination of commercial timber sales, service contracts, stewardship contracts, cooperative authorities, partner capacity, and Forest Service crews would be used to implement the project.

The Modified Proposed Action is intended to address continually changing forest conditions by incorporating principles of adaptive management. In doing so, this alternative proposes an acreage ceiling of up to 360,000 acres that could be treated within pre-established Treatment Opportunity Areas (613,110 acres) rather than identifying site-specific treatment units. During project implementation, the Forest Service would cooperate with other agencies, local governments, interested stakeholders, and organizations to identify specific treatment units (see the Adaptive Implementation and Monitoring Framework in the FEIS for this project). Specific objectives of each treatment unit would be determined prior to any ground-disturbing activities using existing vegetation conditions and a series of project-developed field review forms. The sum of all treatments, regardless of roadless status, would not exceed 360,000 acres and would be dependent on such things as staffing, funding, site-specific resource conditions, and project design features.

Specific activities associated with the Modified Proposed Action include:

- Up to 95,000 acres of stand initiating or even-aged treatment methods.
- Up to 165,000 acres of uneven-aged or intermediate treatments.
- Up to 100,000 acres of other vegetation treatments, including prescribed fire, mastication, and hand thinning
- Constructing not more than 600 miles of temporary road, as necessary, to access treatment areas.

Adaptive Management Treatment Options

A variety of management options including, but not limited to, clearcutting/coppice; group and individual tree selection; salvage; mastication; sanitation; thinning; and prescribed fire would be used to achieve resource objectives identified for individual treatments.

Inventoried Roadless Areas

Roughly 125,200 acres of Inventoried Roadless Areas (IRAs) have been identified as potential Treatment Opportunity Areas (TOAs). No temporary road construction would occur in IRAs.

Road/Access Information

The Modified Proposed Action includes constructing no more than 600 miles of temporary road, as necessary, to access treatment areas. Temporary roads would be for administrative use only (i.e., they would be managed as closed to the public). They would be reclaimed within 3 years of project completion preclude future motorized use and to restore ecological function in the affected areas. Methods for reclaiming temporary roads may include, but are not limited to, re-contouring the road, ripping/scarifying the roadbed, removing culverts, installing drainage features, creating physical barriers to preclude motorized travel, scattering wood/rock debris onto the road, applying seed and mulch to the area, and posting signs.

The alternative also includes utilizing and/or reconstructing existing open and closed NFS roads to access treatment units. Reconstruction may include road blading, culvert installation or replacement, and gravelling. Closed NFS roads would be for administrative access only and would be returned to a closed status with the method of closure being determined at implementation.

Other Activities

Other activities associated with the Modified Proposed Action include, but are not limited to slash treatments (e.g., pile burning, chipping), regeneration surveys, noxious weed control, native grass/forb seeding, and road maintenance associated with implementing vegetation treatments.

Project Design Features and Analysis Assumptions

Project Design Features (PDFs) and Analysis Assumptions have already been developed for the LaVA Project to reduce or prevent potential undesirable effects resulting from management activities and to ensure consistent analysis of project effects, respectively. Project Design Features were developed using guidance from such documents as the USDA Forest Service Guide to Weed Prevention Practices, the State of Wyoming Best Management Practices, Watershed Conservation Practices, Revised Land and Resource Management Plan for the Medicine Bow National Forest (Forest Plan) standards and guidelines, and other environmental protections required by applicable laws, regulations, and policies. The PDFs and Analysis Assumptions specific to the LaVA project are included in the project files.

The following modifications have been made to the Proposed Action to address concerns raised during the July 2017 scoping effort:

- Eliminating the 10 miles of permanent road construction proposed in the July 2017 Scoping Document.
- Developing a new TOA map to better reflect where temporary road construction is and is not allowed, per Forest Plan direction.

A detailed description of the Proposed Action can be found in the Final Environmental Impact Statement for this project.

Comparing Magnitude of Effects by Accounting Unit

The table below provides some metrics regarding invasive species within the accounting units to illustrate differences among them. Because this project has not yet defined specific treatment units and weed species and infestation acreages vary among the accounting units we cannot effectively predict and compare the magnitude of likely changes in invasive species infestations among the accounting units. We can only predict that invasive plant establishment is likely to be greatest in the areas with the highest disturbance to soils and native plant communities.

Table 1. Approximate acres of state-listed noxious weeds and invasive annual grasses documented within the accounting units.

Listing	Invasive Annual Grasses	Noxious Weeds
Accounting Unit	**Estimated acres of cheatgrass (*Bromus tectorum)* and field brome (*Bromus japonicus)* (not a complete inventory)***	**Estimated acres of state-listed noxious weed infestations (not a complete inventory)***
Battle Pass	4	241
Rock Morgan	0	219
Owen Sheep	1,800	753
North Corner	6	952
French Douglas	28	2,026
Fox Wood	1,200	2,600
Bow Kettle	0	207
West French	34	1,661
Cedar Brush	5	1,202
Pelton Platte	368	1,591
Big Blackhall	329	875
Green Hog	31	804
Jack Savery	2	1,240
Sandy Battle	474	9,934

***A complete inventory of invasive grasses or noxious weeds has not been conducted on the Districts, as this would require a large scale, multi-year effort for which funds have not been available. Instead, invasive species are recorded and mapped while conducting other National Forest work including during weed treatment activities. Also, weed locations and densities change annually as a result of spread of untreated existing weed populations, arrival and germination of additional weed seed, new disturbances to soils and native plant communities, and the effects of weed treatments.**

Direct and Indirect Effects of the Modified Proposed Action

Ground disturbance associated with mechanical timber treatments will create an environment favorable to invasive plant species above what may have been created in unharvested/unburned coniferous forest. In untreated forest stands the undisturbed duff layer may inhibit some invasive species establishment. However, mechanical treatments would likely disturb some of that duff layer and expose mineral soil, where invasive plants are well adapted to establish themselves. Roads and the movement of equipment in and out of these areas also facilitate weed establishment.

Long term, regenerating trees will eventually shade out many invasive species in tree harvest units, however, until then, noxious weed infestations could dominate the landscape and produce huge quantities of seed annually that could easily be transported by various vectors to other sites.

Where log decks, landings, burn piles or temporary roads are located on shrubland or grassland sites, the risk of establishment of persistent noxious weed populations is higher than in formerly forested areas. On shrubland or grassland sites where harvest-related activities have compacted or disturbed the soil and damaged native plants, there is a greater risk of long term weed occupation, unless the site is treated, because the native vegetation on such sites will not shade out weeds.

Prescribed fire may increase the likelihood of invasive species establishment since it kills some plants (like big sagebrush) and temporarily sets back the growth of others. This disturbance to the native plant community, increased bare soil and increased nutrients from burned plant material and decomposing roots of killed plants creates a favorable environment for invasive plants. On some shrubland sites, particularly those on steep southerly facing slopes, the risk of cheatgrass invasion is high, as exhibited by existing cheatgrass infestations on both past wildfires and prescribed burns on both districts. Design criteria for this project require that prescribed burns be managed to promote native species and hinder weed species establishment. As part of that goal, areas may be excluded from prescribed burning if they harbor invasive species likely to proliferate after burning, and burned areas must be treated post-burn, where needed, to minimize spread of weeds.

The Modified Proposed Action will provide more wildfire suppression opportunities for fire-fighters than exist under present conditions of heavy downfall and standing dead timber. This is due to the landscape scale, high number of proposed treatment acres, and compressed time frame within which the project would be implemented relative to past vegetation treatment projects. Treatments will create more safe staging areas for fire-fighting operations after implementation; and treatments can be designed to create wide, contiguous areas of reduced fuels that may allow for wildfire containment under some conditions. As a result, some fires may not grow as large as they have in recent years once the proposed treatments are implemented. Smaller fires means fewer acres exposed to increased risk for invasive plant establishment. Wildfires often occur when soil and fuel moisture are low and air temperatures are high, so they can result in high perennial plant mortality and consume plant litter and organic matter in the soil. Because of perennial plant mortality and burning off of the organic matter and native seed bank in the soils in severely burned areas, the potential for weed spread and establishment in areas burned by wildfires is often greater and longer lasting than would result from timber harvest, other mechanical treatments or prescribed fire.

Where shrubland treatments are implemented, a mosaic of recently burned shrublands and older shrublands could reduce the chances that a wildfire in shrublands would quickly spread over a large area. because the amount of shrub canopy cover in recently burned sites would be lower and shrubs would be more widely spaced than in a dense older shrub stand. This would be due to the fact that there would not be a contiguous dense shrub canopy through which the fire could spread. The recently treated portions of the mosaic would have no shrubs or young shrub, widely spaced shrubs that may not carry a fire as well as the large shrubs in the untreated areas.

This project includes several design features which will reduce the likelihood of introduction of new weed species or populations and slow their spread. These design features are widely employed by federal agencies and are included in the USDA Forest Service Forest Service Guide to Weed Prevention Practices (2001). Applicable design features would be applied in all locations where treatments are implemented. The proposed project also includes an Adaptive Implementation and Monitoring Framework which provides for input from publics, agencies and Forest Service specialists before implementation as well as a monitoring component which will help inform treatment design and

implementation relative to invasive plant species as the project proceeds over the projected 15-year term.

Additional funds for noxious weed treatment may become available from timber sale proceeds, however, it is likely the funds made available through timber sale receipts, combined with the regular annual district noxious weed treatment program will not be enough to fully inventory and treat all new or enlarged weed infestations from this large scale vegetation management program as well as all the other sites where invasive weeds occur or may be introduced or spread.

Cumulative Effects

Cumulative Effects – No Action

Effects of past timber sales and prescribed burns in and around the project area are cumulative to the effects of vegetation treatments that are expected to occur under the No Action Alternative. Currently, quite a few timber sales are in the late planning or implementation stage on the west and north portions of the Sierra Madre, in the Ryan Park area of the west Snowy Range, along with the southeast portion of the Snowy Range. The Forest Service database of record for recording accomplished vegetation treatments lists 113,546 acres of timber treatments, 66,984 acres of fuels treatments, as well as 84,823 acres burned by wildfire that are recent enough to still be having an effect upon the environment. Current and foreseeable future projects unrelated to the modified proposed action discussed in this report propose treating another 20,452 acres of timber and implement fuels treatments on another 4,713 acres. Where disturbed soil from past activities has allowed invasive species to become established, a ready seed source exists to colonize newly disturbed areas. In addition to these past, current and future treatments and past wildfires, other activities that create soil disturbance and/or weaken native plant communities contribute to the problem of invasive plant species. Those activities which can introduce and/or enable establishment and spread of invasive plant species are numerous and include, but are not limited to:

- Forest visitors and their vehicles, livestock, pets and gear, which can introduce weed seeds or spread existing infestations.
- Illegal off-road motorized travel.
- Livestock carrying weed seed in manure, or on their feet or hides. Livestock shipped in from distant areas may bring new weed species not already found in our area.
- Livestock trampling vegetation in localized areas such as around salt blocks, gates, and watering areas so that bare soil exists for weed establishment.
- Fence construction or re-construction and cattle guard installation.
- Road maintenance such as grading, graveling, and culvert installation and cleaning.
- Ditch maintenance that involves digging out or spraying willows, sediment removal, bank repairs.
- Wildlife carrying seed in manure or on their feet or fur.
- Wildfire which creates bare soil for weed establishment and weakens or kills competing native plants.
- Road decommissioning that involves soil disturbance such as ripping, berming or removal of culverts.
- Landslides and slumps that expose bare ground.

- Patches of dead trees from insect, disease or blowdown.
- Repeated weed treatments (mechanical or herbicide) to eradicate high priority weeds where the native plant community on that site is weakened or killed by those treatments.
- Seeding disturbed ground with seed that contains contaminants of invasive species seed (on Forest Service land or privately owned inholdings). Even certified noxious weed-seed-free seed can contain seed of other invasive species not listed as noxious by the State of Wyoming.
- Use of gravel, rock, mulch or other construction or erosion control material contaminated with weed seed.

Past effects of treatments of shrublands through prescribed fire or herbicide application are cumulative to effects from prescribed fire treatments proposed in this project. BCH and Laramie districts conducted some relatively large scale aerial spraying of 2,4-D herbicide to kill big sagebrush 50-60 years ago and have implemented quite a few prescribed burns on shrublands along the Forest Boundary since that time. Because some past treatments have enabled cheatgrass to become dominant or co-dominant on some shrubland sites, they have increased the amount of cheatgrass seed available to colonize new burn areas. Cheatgrass seed is readily transported by vehicles, livestock, wildlife and people who travel through infested areas and is well adapted, within this analysis area, to colonize some types of burned shrubland sites, particularly those with a southerly exposure, steep slope, and rocky soils.

Climate change is another factor likely to cumulatively affect the establishment and expansion of weed populations within the project area. Wyoming winter temperatures have increased 1.9° F above the historical average since 1995 and the number of days with minimum temperatures above 70 °F has been above the long-term average since 2000. All states within the Rocky Mountain Region of the U.S. Forest Service are predicted to experience unprecedented warming within the 21st Century. Precipitation projections are less certain, but moisture availability for plants is likely to be lower even if precipitation remains the same, given the projected increase in temperature (Rice et al. 2018). These temperature and moisture changes may allow some invasive species to compete more effectively with native plant species. Invasive plant species in high elevation areas have already expanded globally over the last decade (McDougall et al. 2011).

Cumulative Effects – Modified Proposed Action

Effects of the Modified Proposed Action are cumulative to the effects described above for the No Action Alternative, and will not be repeated here. The primary difference between the two alternatives is one of scope and scale. There will be many more acres of vegetation management under the Modified Proposed Action than have historically been implemented over a 15 year period within the project area. We also have a larger and more diverse population of invasive species than we did in the past. This therefore provides an opportunity for a very large increase in infested acres, even with the weed treatment program in place and the design features, and Adaptive Management and Monitoring Framework that are included in this project. Ultimately, long term agency commitment to weed detection and control, manifested by consistent and ample funding combined with more rigorous weed prevention measures, will determine how much invasive plants of concern will increase over the term of this project and beyond.

REFERENCES

McDougall, K.L.; Khuroo, A.A., Loope, L.L. 2011. Plant invasions in mountains: global lessons for better management. Mountain Research and Development. 31(4): 380-387.

Rice, J.R.; Joyce, L.A., Regan, C.; Winters, D., Truex, R. 2018. Climate change vulnerability assessment of aquatic and terrestrial ecosystems in the U.S. Forest Service Rocky Mountain Region. Gen. Tech. Rep. RMRS-GTR-376. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 216 p.

USDA Forest Service (2001). USDA Forest Service Guide to Weed Prevention Practices. 25 pages.

USDA Forest Service. (2003). Medicine Bow National Forest land and resource management plan - 2003 Revision. Laramie, WY: Medicine Bow-Routt National Forests and Thunder Basin National Grasslands.

Westbrooks, R. 1998. Invasive plants, changing the landscape of America: Fact book. Federal Interagency Committee for the management of Noxious and Exotic Weeds (FICMNEW). Washington, D.C. 109 pages.